**Remarks**

Claims 35-37, 43, 46, 47, 49-51, and 53-57 are pending. Applicant has hereinabove cancelled claims 36 and 53-56 without disclaimer or prejudice to applicant's right to pursue the subject matter of these claims in the future. In addition, applicant has hereinabove amended claims 35, 37, 49 and 50.

Support for the amendments to claim 35 can be found in the specification as originally filed at, *inter alia*, page 3, lines 7-10; page 14, lines 16-22; page 22, lines 26 to 29; page 24, lines 23-26; page 25, line 28 to page 26, line 4; page 26, lines 8-11; page 29, lines 13-14; page 30, line 3; page 49, lines 22-27; page 51, lines 1-6 and line 11; page 61, lines 1-6; page 77, lines 22-28; and page 78, lines 5-7 and lines 11-27. Claims 37, 49 and 50 have been amended to correct for antecedent basis.

Accordingly, applicant maintains that amended claims 35, 37, 49 and 50 introduce no new matter and are fully supported by the application as originally filed.

**Obviousness-Type Double Patenting**

The Examiner stated that claims 35-36 and 53-54 are provisionally rejected on the ground of non-statutory obviousness-type double patenting as being unpatentable over claims 85 of copending Application No. 10/512,518. The Examiner stated that although the conflicting claims are not identical, they are not patentably distinct from each other because both sets of claims are directed to a method of treating a disorder of tissues involving apoptosis of tissue cells comprising administering an agent effective to inhibit apoptosis of the cells within the tissue. The Examiner

stated that the basis for this provisional rejection is set forth for claims 35-36 and 45 at pages 5-6 of the previous Office Action issued on August 8, 2007.

The Examiner further stated that claims 35-37, 43, 46-47, 49, 50, 51 and 53-57 are provisionally rejected on the ground of non-statutory obviousness-type double patenting as being unpatentable over claims 69, 77-78, and 82-84 of copending Application No. 11/234,879. The Examiner stated that although the conflicting claims are not identical, they are not patentably distinct from each other because both sets of claims are directed to a method of treating a disorder comprising administering stromal-derived factor-1. The Examiner stated that the basis for this provisional rejection is set forth for claims 35-37, 43, 45-49, and 51-52 at pages 6-7 of the previous Office Action issued on August 8, 2007. The Examiner stated that these are provisional obviousness-type double patenting rejections because the conflicting claims have not in fact been patented.

In response, applicant notes that, as the Examiner has acknowledged, these are provisional rejections as the claims cited have not yet been patented. Accordingly, if this is the sole remaining ground of rejection, applicant respectfully maintains the previous request to the Examiner to withdraw the rejection and to allow the claims as amended.

**Claims rejected Under 35 U.S.C. §103**

*Claims 35-37, 43, 46, 49-51 and 53-57*

The Examiner stated that claims 35-37, 43, 46, 49-51 and 53-57 are rejected under 35 U.S.C. §103(a) as being unpatentable over

Petersen, BE (U.S. 2002/0094327) in view of Hung et al. (U.S. 2003/0171294). The Examiner stated that Petersen teaches that modulating the level of SDF-1α protein in a target tissue can selectively direct migration of pluripotent stem cells to the target tissue (page 1, [0006]). The Examiner stated that Petersen continues to disclose that "[b]y increasing the number of pluripotent stem cells that traffic to the target tissue, the rate of tissue repair can be increased because there will be a greater number of pluripotent stem cells in the target tissue that can differentiate into cells which can repopulate and partially or wholly restore the normal function of the damaged tissue" (page 1, [0006]). The Examiner stated that Petersen teaches a method of targeting a pluripotent stem cell to a target tissue comprising introducing the SDF-1α protein into the mammalian subject in order to increase the concentration of SDF-1α in the target tissue (page 1, [0007]). The Examiner stated that Petersen discloses that SDF-1α can be introduced by intravenous injection, intraarterial injection, injection into the target tissue, intrahepatic injection, or by introducing a matrix impregnated with SDF-1α (page 1, [0007]). The Examiner stated that Petersen teaches that target tissues can be any within a mammalian subject, such as heart [tissue] (page 8, column 2, [0063]). The Examiner also stated that Petersen also discloses that target cells for use in the invention can include any cell in or that migrates to a target tissue (page 8, column 2, [0063]). The Examiner stated that Petersen does not teach that SDF-1α is administered to the heart intramyocardially or intracoronarily.

The Examiner stated that Hung et al. teach the intramyocardial and intracoronary administration of angiogenic factors, such as

fibroblast growth factor (FGF), to the heart (page 2, paragraphs 9-10; page 4, paragraph 22; page 5, paragraph 34; Figure 8).

The Examiner alleged that it would have been obvious to the person of ordinary skill in the art at the time the invention was made to modify the method of administering of SDF-1α to heart tissue as taught by Petersen by utilizing intramyocardial or intracoronary administration as taught by Hung et al. The Examiner alleged that the person of ordinary skill in the art would have been motivated to make that modification in order to localize cell migration/differentiation and tissue repair (see for example, Hung et al. page 1, [0007]).

In response, applicant respectfully traverses the Examiner's rejection. However, in order to expedite prosecution, and without conceding the correctness of the Examiner's position, applicant has hereinabove amended claim 35, from which the remaining rejected claims depend, to recite, *inter alia*, a method of treating a subject suffering from a disorder of a heart tissue involving loss or apoptosis of cardiomyocytes which comprises intramyocardially or intracoronarily administering to the subject an amount of an agent comprising a human stromal derived factor-1 effective to induce regeneration of endogenous cardiomyocytes and thereby treat the disorder of the heart tissue involving loss or apoptosis of cardiomyocytes in the subject. Applicant maintains that the combination of Hung et al. and Petersen does not teach such a method.

Specifically, the combination of prior art does not teach treating a subject suffering a disorder of a heart tissue. Moreover, the combination does not teach "induc[ing] regeneration of endogenous

cardiomyocytes" (emphasis added) and thereby treating a disorder of a heart tissue involving "loss or apoptosis of cardiomyocytes" as recited in claim 35 as amended hereinabove.

In contrast, Petersen is directed to a method of directing stem cells to selected tissues by administering SDF-1 to that selected tissue. This is a fundamentally different concept to that of administering SDF-1 to a selected tissue in order to protect or enhance proliferation of cells endogenous to that tissue. Hung et al. in combination with Petersen does not cure this deficiency.

Moreover, there is nothing in Petersen to suggest administering SDF-1 to a diseased heart. Furthermore, this deficiency of Petersen is not overcome by combining it with Hung et al.

Applicant further notes that there is nothing in Hung et al. to suggest administration of SDF-1 to the heart. Hung et al. instead describes administration of an angiogenic factor to the myocardium in order to induce angiogenesis in the heart. This concept is clearly not related to the method described in Petersen, which concerns mobilization of stem cells to specific tissue sites. It is also different to the presently claimed invention, which concerns administration of SDF-1 to heart tissue in order to treat heart disorders. Combining Petersen and Hung et al. does not arrive at the invention as claimed.

*Claim 47*

The Examiner rejected claim 47 under 35 U.S.C. 103(a) as being unpatentable over Petersen, BE (US 2002/0094327; priority to November 5, 2000) and Hung et al. (US 2003/0171294; priority to August 13, 1999) as applied to claims 35-37, 43, 46, 49-51, 53-57 above, and further in view of Rempel et al. (Clin Can Res 6: 102-111, 2000).

The Examiner stated that the teachings of Petersen and Hung et al. are set forth above. The Examiner admits that Petersen and Hung et al. do not teach the administration of SDF-1β.

The Examine stated that Rempel et al. teaches that the SDF-1 gene encodes two isoforms, SDF-1α and SDF-1β, that arise from alternative splicing (page 102, column 2, last paragraph). The Examine also stated that Rempel et al. also disclose that these isoforms differ only in that SDF-1β contains four additional 3' amino acids (page 102, column 2, last paragraph).

The Examiner alleged that it would have been obvious to the person of ordinary skill in the art at the time the invention was made to modify the method of intramyocardially or intracoronarily administering SDF-1α to heart tissue as taught by Petersen and Hung et al. by substituting SDF-1α with SDF-1β as taught by Rempel et al. The Examiner stated that since Rempel et al. teach that SDF-1α and SDF-1β are isoforms encoded from the SDF-1 gene and that SDF-1β only contains four additional amino acids as compared to SDF-1α, it would have been obvious to one skilled in the art to substitute the utilization of SDF-1α for the SDF-1β to achieve the

predictable result of treating a subject suffering from a heart disorder.

In response, applicant respectfully traverses the Examiner's rejection. Applicant submits that Rempel et al. teach the use of SDF-1 to treat subject with glioblastoma tumors rather than to treat subjects with diseases of the heart as specified in the invention as claimed. Moreover, Petersen specifically only teaches administration of SDF-1$\alpha$.

Applicant submits that it would not have been obvious to the person of ordinary skill in the art at the time the invention was made to modify the method of intramyocardially or intracoronarily administering SDF-1$\alpha$ to heart tissue as disclosed in Petersen and Hung et al. by substituting SDF-1$\alpha$ with SDF-1$\beta$. Accordingly, in the absence of applicant's discovery, there would be no motivation to use SDF-1$\beta$ in the method disclosed in Petersen. In addition, even if Petersen was combined with Hung et al. and Rempel, et al. the combination of prior art still does not teach the elements of claim 35, from which claim 47 is dependent upon. Specifically, the cited combination of prior art does not teach treating a subject suffering a disorder of a heart tissue. Moreover, the combination does not teach "induc[ing] regeneration of endogenous cardiomyocytes" and thereby treat a disorder of a heart tissue involving "loss or apoptosis of cardiomyocytes" as recited in claim 35 as amended hereinabove. Indeed, there is no indication in the prior art that intramyocardial or intracoronary administration of SDF-1 would be able to treat a disorder of a heart tissue involving loss or apoptosis of cardiomyocytes. Applicant notes that his discovery of such a treatment is not suggested in the prior art. Finally, there is no teaching in the

combination of cited art of administering an amount of SDF-1 which is effective to treat such a disorder as recited in claim 35 as amended. As such, the invention as claimed is not obvious over the combination of cited prior art.

Accordingly, applicant respectfully requests that the Examiner reconsider and withdraw this ground of rejection.